GY360 Structural Geology Net Slip Problem

Introduction

With the attached figure and the data provided below, solve for the net slip vector for the fault which displaces dikes A and B on the map. You can assume that the fault has a negligible rotational component of rigid body deformation. You should construct the orthographic portion of your solution in the cross section provided below the map. Attach the stereonet part of the solution to this handout to turn in. Solve the problem in using the following steps:

STEP 1: Plot the great circles on the stereonet that represent the fault, dike A, and dike B attitudes. Calculate the rake angle of dikes A and B in the plane of the fault.

Rake angle Dike A:_____
Rake angle Dike B:_____

STEP 2: On the cross section project vertically down the intersections of A, B, A', and B' contacts with the fault contact to the horizontal ground surface (see tree). Relative to these points construct the trace of A, B, A', and B' using the appropriate rake angle. Extend these lines until A and B intersect, and then extend A' and B' until they intersect also. Note that the intersections may occur above as well as below the current erosional surface. Also note that the intersection of A and B is a piercing point that lies within the north fault block, while the intersection of A' and B' lies in the south fault block.

STEP 3: Connect the intersection points A-B and A'-B' with a line. This is the net slip vector. Measure the magnitude of this vector according to the map scale. Measure the rake angle that this vector makes with the strike line of the fault. Label this information on the cross section. Divide up the strike slip and dip slip components of the net slip by constructing a right triangle with hypotenuse equal to the net slip. Label the magnitudes of each component. Summarize the results below.

Dip slip component magnitude and sense: _____
Strike slip component magnitude and sense: _____
Net slip magnitude: _____
Fault classification: _____

STEP 4: With the rake angle of the net slip vector measured above, plot the location of the net slip vector on the original stereonet. Convert the position to a bearing and plunge.

Net slip vector attitude: _____

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